

# SEASONAL CHANGES IN WOOD DUCK ROOSTING FLIGHT HABITS<sup>1</sup>

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MOST people are aware that such birds as crows and blackbirds congregate nightly in large numbers at roosts during late summer and fall, but few people know that Wood Ducks (*Aix sponsa*) have a similar habit. Wood Ducks prefer marshes and swamps in wooded bottomlands for many of their activities including roosting.

Morning and evening roosting flight habits of Wood Ducks were studied from March through November, 1958, in Iowa as part of an investigation of Wood Duck census techniques (Martin, 1959). Little effort had been made previously to determine Wood Duck flight habits. Such information is necessary to evaluate roosting flight counts.

Muskrat Lake, a backwater slough along the lower reaches of the Iowa River in Louisa County, Iowa, was the main Wood Duck roosting flight study area. Wood Duck roosts were found by observing and tracing flights to and from the roosts. Two flights followed narrow, well-defined paths to roosts, and counts were made along those routes as well as at the roosts. Observation points were established where a clear view of flying Wood Ducks, silhouetted against a background of sky, could be obtained to facilitate counting during poor light at dawn and dusk. Observations of morning and evening flights at Muskrat Lake permit examination of some interrelationships between seasonal change and Wood Duck roosting flight habits.

## CHANGES IN FLIGHT TIMES

Several changes in roosting flight habits occurred as the season advanced. Both morning and evening flights changed gradually, occurring nearer darkness and over shorter periods of time as the season advanced (Figs. 1, 2).

Linear regression techniques similar to those of Snedecor (1956) were employed to aid in describing the changes which occurred in the Wood Duck roosting flights at Muskrat Lake as the season progressed from early August to late October. Because the statistical analyses were only approximate for the data involved, emphasis was placed on the descriptive tools of regression techniques rather than on tests of significance, though the latter were not omitted.

Time at which the first Wood Duck was seen leaving the roost, time at which Wood Ducks were leaving the roost in greatest numbers, and time when the last Wood Duck was seen leaving the roost were plotted for each morning flight count (Fig. 3). For purposes of computation, dates were

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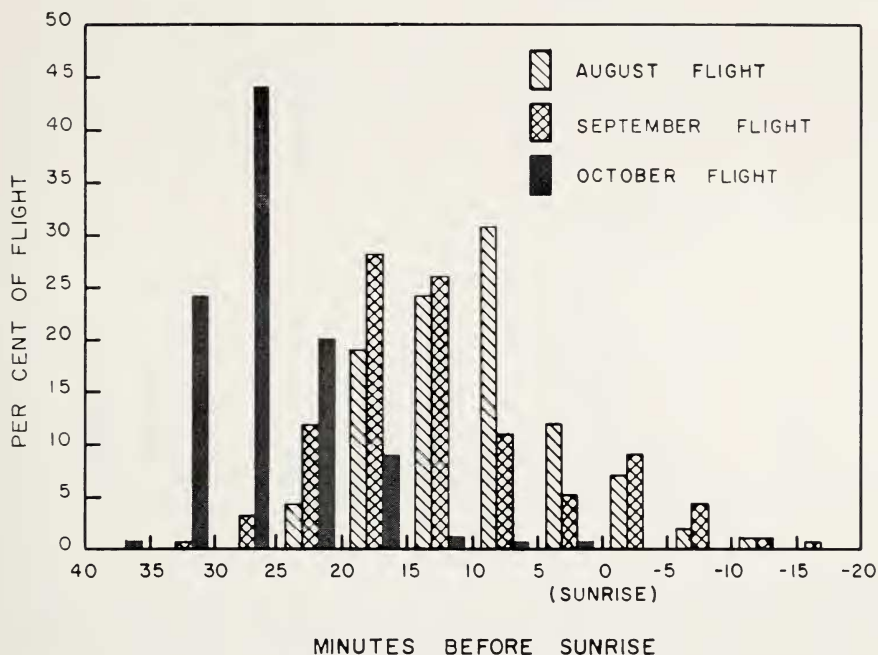


FIG. 1. Average daily distribution of morning roosting flight activity of Wood Ducks at Muskrat Lake in 1958. (August averages based on a 134-bird index from six counts. September averages based on a 283-bird index from 10 counts. October averages based on a 1106-bird index from seven counts.)

numbered consecutively, with August 1 as the zero-point. The regression coefficient, the statistic computed and tested, is affected neither by choice of origin nor by corresponding choices of intercept points. Numbers corresponding to dates of counts were then used in calculations. Linear regression of daily flight time on date of count measured from August 1 was computed for each of the three times mentioned above (Fig. 3). Each regression coefficient is significant at the 0.1 per cent probability level. The regressions indicate that on the average for each 10-day period which passed, Wood Ducks left the roost 4 minutes earlier relative to sunrise. Similar calculations were made for times of earliest, peak, and latest roosting flight activity for each evening flight observed at Muskrat Lake (Fig. 4). Each regression coefficient is significant at the 0.5 per cent probability level. The indication is that on the average for each 10-day period later in the fall, Wood Ducks arrived at the roost about 7 minutes later relative to sunset.

The method of analysis is approximate for this type of data. Changes in

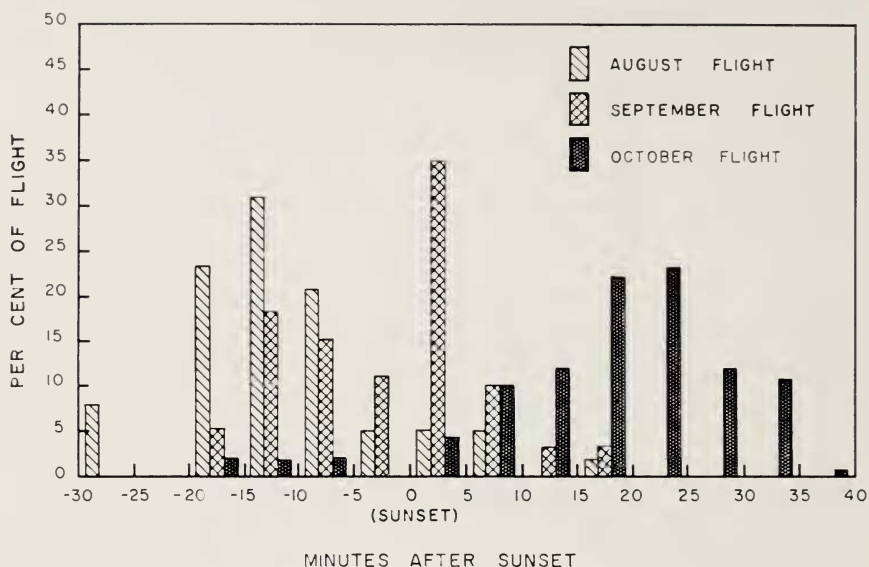


FIG. 2. Average daily distribution of evening roosting flight activity of Wood Ducks at Muskrat Lake in 1958. (August averages based on a 39-bird index from five counts. September averages based on a 199-bird index from six counts. October averages based on a 1057-bird index from seven counts.)

habitat (water level, food supply) or changes in population size as well as chronology of the season may have influenced the time schedule of Wood Duck roosting flight activity. Also, these regressions of flight times on dates are probably not linear, but instead, slope more steeply early in the season and less steeply later in the fall. The approximations are suitable for practical applications to field work, however.

Major morning flight activity in September and October took place before sunrise, and major evening flight activity in October occurred after sunset. Martin (1957) found similar habits in Wood Ducks in Indiana. Smith (1958) reported that in Louisiana in both late August and late September, greatest evening flight activity took place between one-half hour before sunset and darkness, which also agreed with findings in southeast Iowa. Hester (1955), working in North Carolina, also noted that evening flights occurred well after sunset late in the season. Observations made in north-central Iowa subsequent to this study indicated that morning and evening flights in that area in August occurred nearer darkness than they did in southeast Iowa. Evening flights on the north-central area in August occurred after sunset, and morning flights started one-half hour before sunrise and lasted 20 minutes.

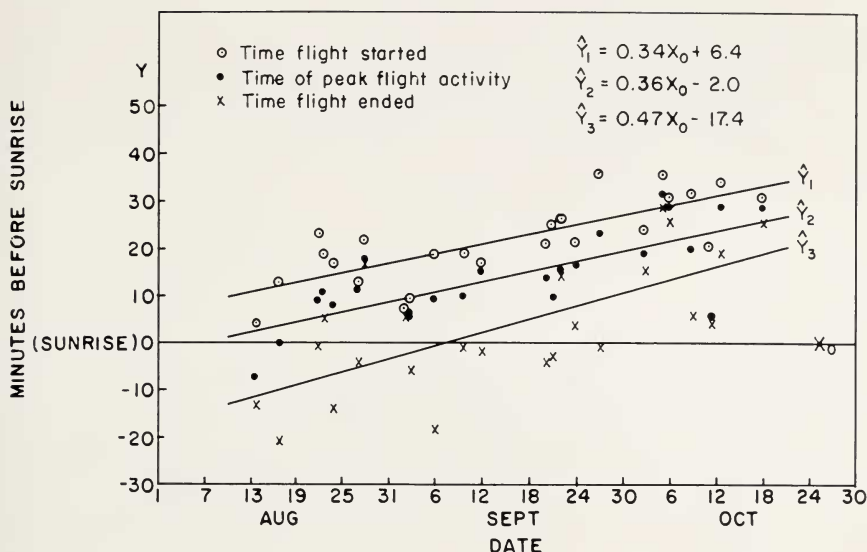


FIG. 3. Comparison of the starting, peak, and ending times for morning roosting flights of Wood Ducks at Muskrat Lake in 1958. The linear regression of time on date of count is plotted for each.

#### DURATION OF FLIGHT ACTIVITY

Duration of flight activity tended to shorten in both evening and morning flights as the season progressed. Converging lines on Figs. 3 and 4 indicate this change. It is more evident when the period of greatest activity is traced through the season. Duration of periods of major morning flight activity (about 90 per cent of the Wood Ducks seen in a flight) averaged 19 minutes (range 6 to 40 minutes) in August, 17 minutes (range 2 to 34 minutes) in September, and only 6 minutes (range 4 to 12 minutes) in October. Average duration for major evening flight activity was 25 minutes (range 12 to 50 minutes) in August, 23 minutes (range 13 to 50 minutes) in September, and 16 minutes (range 6 to 30 minutes) in October. Greatest day-to-day variation in duration of flight activity occurred early in the season when the number of birds in the area was relatively small. Despite high October populations, flights were extremely concentrated in time, particularly morning flights. Evening flights came to the roost in smaller groups and over a longer period than were recorded for morning flights from the roost. Martin (1957) noted a similar difference in Indiana. Morning flights usually left almost en masse in October when greatest numbers of Wood Ducks were present. This made estimation of numbers difficult, especially because the birds left well before sunrise when visibility was still poor.

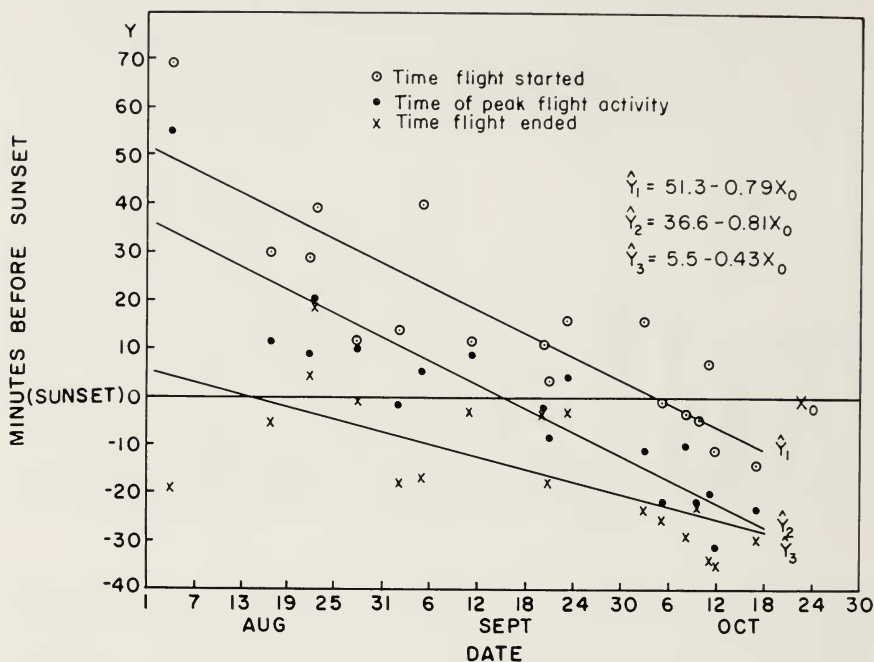


FIG. 4. Comparison of the starting, peak, and ending times for evening roosting flights of Wood Ducks at Muskrat Lake in 1958. The linear regression of time on date of count is plotted for each.

### DISCUSSION

Knowledge of seasonal changes in Wood Duck roosting flight habits may be useful in evaluating Wood Duck roosting flight counts as possible indexes of abundances. In early fall, evening roosting flights began about 45 minutes ( $\pm 15$  minutes) before sunset with little activity after sunset. Counts made during this period of time and ending shortly after sunset will include most Wood Ducks in a roosting flight. Early fall morning counts should begin about 30 minutes before sunrise and continue until about 15 minutes after sunrise. To be reliable, the counts must be made from suitable observation points and under weather conditions conducive to good visibility. Arrival of waves of new migrants may spread flights over longer periods with more apparently random flight than usual.

Well-defined feeding flights occur prior to evening roosting flights in some areas. In such areas roosting flight habits may be somewhat different from those observed in this study where large-scale evening feeding flights were not noted. Additional research effort on other areas should contribute useful information on this point.

It is important to keep in mind that fall Wood Duck populations are mobile and changing, so the observer must study the flights carefully and be ready to modify his work schedules as conditions seem to warrant.

The peak population of Wood Ducks (300) at Muskrat Lake occurred during the second week in November.

#### SUMMARY

Wood Ducks congregated nightly at roosts in late summer and fall. Both morning and evening roosting flights changed gradually, occurring nearer the hours of darkness and over shorter periods of time as the fall season advanced. Major morning roosting flight activity early in the fall occurred during a period of about 45 minutes, usually ending by 15 minutes after sunrise. Early fall evening roosting flight activity occurred primarily during the 50-minute period ending shortly after sunset. Late season (October and November) roosting flight activity took place before sunrise and after sunset.

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